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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,055	05/13/2005	Jan-Willem Lobeek	NL 021179	9412
24737	7590	11/07/2006	EXAMINER	
PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510			SUMMONS, BARBARA	
			ART UNIT	PAPER NUMBER
			2817	

DATE MAILED: 11/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/535,055	LOBEEK, JAN-WILLEM	
	Examiner	Art Unit	
	Barbara Summons	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2005 (pre-amendment).
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 is/are allowed.
- 6) ☒ Claim(s) 1-8, 10 and 11 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/30/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 5, on line 23, there is a reference to "a method as claimed in claim 7": Firstly, claim 7 is not a method claim. Secondly, the reference to "claim 7" should be removed from the specification, since once the application is allowable, the claims may be renumbered, such that the referred to claimed subject matter may not be in "claim 7" anymore.

Appropriate correction is required.

Claim Objections

2. Claims 4-8 and 11 are objected to because of the following informalities:

In each of claims 4-8, on line 1, "(1)" should be deleted since the reference sign "1" has been used to indicate "a band separating unit" (see claim 1, lines 1-2) and not an "electronic device".

In claim 8, on line 3, the "the" before "silicon dice" should be deleted since "silicon dice" have not been previously mentioned in the claim.

In claim 11, on line 3, it appears that each occurrence of "G" should be changed to -- GHz --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4-8 and 11 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the Tx-band" on line 4 thereof. There is insufficient antecedent basis for this limitation in the claim. Note that claim 1 could be referring to a band separator for a dual band receiver. Should claim 4 correctly depend from claim 3 (see line 3 thereof)?

Claim 5 recites the limitation "this antiresonant circuit" on line 2 thereof. There is insufficient antecedent basis for this limitation in the claim. Should claim 5 correctly depend from claim 4 (see the last line thereof)? See also the correctly written claim 7.

Claim 6, similarly to claim 4, recites the limitation "the Rx-band" on lines 4-5 thereof. There is insufficient antecedent basis for this limitation since claim 1 could be referring to a band separator of a dual band transmitter. Note that it does not appear that the dependency of claim 6 can be changed since claim 2 provides antecedent basis for "the series inductor".

Claim 8 recites the limitation "the inductors" (plural) on line 2 thereof. There is insufficient antecedent basis for this limitation in the claim. Should claim 8 correctly depend from claim 2, which provides antecedent basis for "the series inductor" as noted above?

Claim 11, recites "Use of a duplexer as claimed in claim 2" on line 1, which lacks antecedent basis in the claim since a "duplexer" is not recited until claim 3. Should claim 11 correctly depend from claim 3?

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Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-8 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bradley et al. U.S. 6,262,637 (cited by Applicant) in view of Hickernell U.S. 6,201,457.

Fig. 6 of Bradley et al. discloses an electronic device comprising a band separating unit that is a duplexer 200 for USPCS CDMA (see col. 9, lines 40-42) comprising: a first/transmit port 124; a second/receive port 126; an antenna port 128; a first/Tx band pass filter 202, that is a ladder circuit type film bulk acoustic resonator (FBAR) filter, connecting the first/Tx port 124 and the antenna port 128; a series arrangement of a second/Rx band pass filter 204, that is a ladder circuit FBAR filter, and a frequency tuning element that is an auxiliary series inductor 241 that provides a series resonance with the static capacitance of the FBAR 211 (see col. 11, lines 3-6) in the Rx frequency band in order for the device to function, connecting the second/Rx port 126 and the antenna port 128. Regarding claim 8, see col. 11, lines 48-59 and Fig. 5B with col. 8, line 27.

However, Bradley et al. does not disclose the first series element 211 of the second/Rx filter having a parallel inductor, or tuning the series inductor 241 an the static capacitance of resonator 211 to the center frequency of the receive filter.

Hickernell discloses in the closely related art of surface acoustic wave (SAW) filters that are analogous art because they are electrical equivalents of FBAR filters (see Wadaka et al. cited below as evidence), that it is known to connect an inductor 104 (see Fig. 6 and col. 5, lines 3-4) in parallel with the first series resonator of a ladder filter (see col. 6, lines 1-3) to create a notch filter that would eliminate an undesirable frequency (see e.g. col. 4, lines 60-65) which could obviously be the Tx frequency, since Hickernell explicitly suggests using the filter as a receive filter in a duplexer (col. 7, lines 51-52).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the FBAR duplexer of Bradley (Fig. 6) by having provided a parallel inductor in parallel with the first series element 211 providing an anti resonant (notch) frequency at the center of the Tx band, as suggested by the analogous art electrically equivalent SAW filter of Hickernell (Fig. 6), because such an obvious modification would have provided the advantageous benefit of not allowing the Tx frequencies to pass to the Rx filter as suggested by Hickernell (see notches 10 and 14 in Figs. 1, 4 and 7) who specifically suggests using such a filter as a receive filter in a duplexer (see col. 7, lines 51-52). It would have been equally obvious to one of ordinary skill in the art at the time the invention was made to have the series inductor 241 with the static capacitance of the resonator 211 be tuned to the center frequency of the Rx band, and the parallel inductor with resonator 211 be tuned to the center of the Tx band, because such obvious modifications would have merely optimized the rejection of the Tx band and the passing of the Rx band as would have been known by one of ordinary skill in the art.

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7. Claim 10 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bradley et al. U.S. 6,262,637 (cited by Applicant) in view of Hickernell U.S. 6,201,457 as applied to claim 1 above, and further in view of Zierdt EP 1 126 604.

The Bradley/Hickernell combination discloses the invention as discussed above, except for the parallel inductor being integrated with the FBAR.

Zierdt discloses that it is known to form an inductor 240 (Fig. 7) that is in parallel with an FBAR, integrally with the FBAR on the FBAR substrate (see col. 4, lines 55-57).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Bradley/Hickernell combination by having provided the parallel inductor integrally with the FBAR, because such an obvious modification, as suggested by the exemplary teaching of Zierdt (ibid.), would have been a mere rearrangement of parts that would have provided the benefit of miniaturization as would have been known by one of ordinary skill in the art.

Allowable Subject Matter

8. Claim 12 is allowable over the prior art of record.

9. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 12, although an obvious device comprising all of the claimed features is considered disclosed by the prior art of record, the prior art is not considered to disclose the recited method "of isolating an Rx-band and a Tx-band in a duplexer" having the recited filters and each of the recited "antiresonant circuit" and "resonant circuit" and all of the other recited features. Regarding claim 9, the prior art of record does not disclose a triplexer.

Regarding the "X" reference on the associated International Search Report, the references do not show both the FBAR filter and wherein "the first element (11) of the second band-pass filter has a parallel inductor" (claim 1, lines 9-11) and wherein "the first element" is a "series" FBAR (see claim 1, lines 7-9).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wadaka et al. U.S. 5,789,845 is provided as evidence that SAWs and FBARs are known electrical equivalents in the acoustic resonator filter art (see col. 1, lines 38-43).

Ella U.S. 6,081,171 discloses an FBAR filter using a parallel inductor with a series arm resonator (see e.g. the cover figure).

Espenschied U.S. 1,795,204 also discloses a bulk acoustic wave filter using a parallel inductor with a series arm resonator (see Fig. 8).

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

bs
November 5, 2006


BARBARA SUMMONS
PRIMARY EXAMINER